



HEASARC
High Energy Astrophysics
Science Archive Research Center



HEASARC Supported Activities at SAO

Roger Brissenden

Outline

1. SAO/HEASARC Coordination
2. *Chandra* Mission Status
3. HEASARC Activities at SAO
4. Chandra Data Archive (CDA)
5. CalDB
6. SAOImage ds9

1. SAO/HEASARC Coordination

- HEASARC established partnership with SAO in 1999 in order to strengthen the ties between the two groups, access expertise of both groups, maximize common approaches, and allow integration of the Chandra archive
- Funding for ~1.25 FTE provided to support closer ties in the areas of archive standards, CalDB and software development (e.g., DS9)
- Partnership has been effective with coordinated extensions to archive standards, CalDB and providing direct support for DS9 development
- Effort during the present 4 years focused on full *Chandra* archive integration, extending CalDB, support for DS9 and VO, with an opportunity to locate the *Chandra* archive at SAO for the long term
- SAO will participate in HEASARC 2008 Senior Review preparations

Staff at SAO

<u>Who</u>	<u>SAO Role</u>	<u>HEASARC Role</u>	<u>FTE %</u>
Roger Brissenden	CXC Manager	Associate Director	<5
Arnold Rots	<i>Chandra</i> Archive Scientist	Archive Integration	25
Dale Graessle	<i>Chandra</i> CalDB Scientist	CalDB Interface	25
Bill Joye	SAOImage ds9 Developer	SAOImage ds9	75

2. *Chandra* Mission Status

- 8 years of Operation on 23 July 2007
- Cycle 8 observations on track, observing efficiency close to optimal
- Spacecraft and Science Instruments continue to operate well; no significant anomalies
- NASA funding baseline for 10 year mission
- Steps being taken to extend to 15+ mission
- Consumables not a factor in extending lifetime
- Chandra (and Spitzer) to be reviewed in the 2008 Senior Review

3. HEASARC Activities at SAO

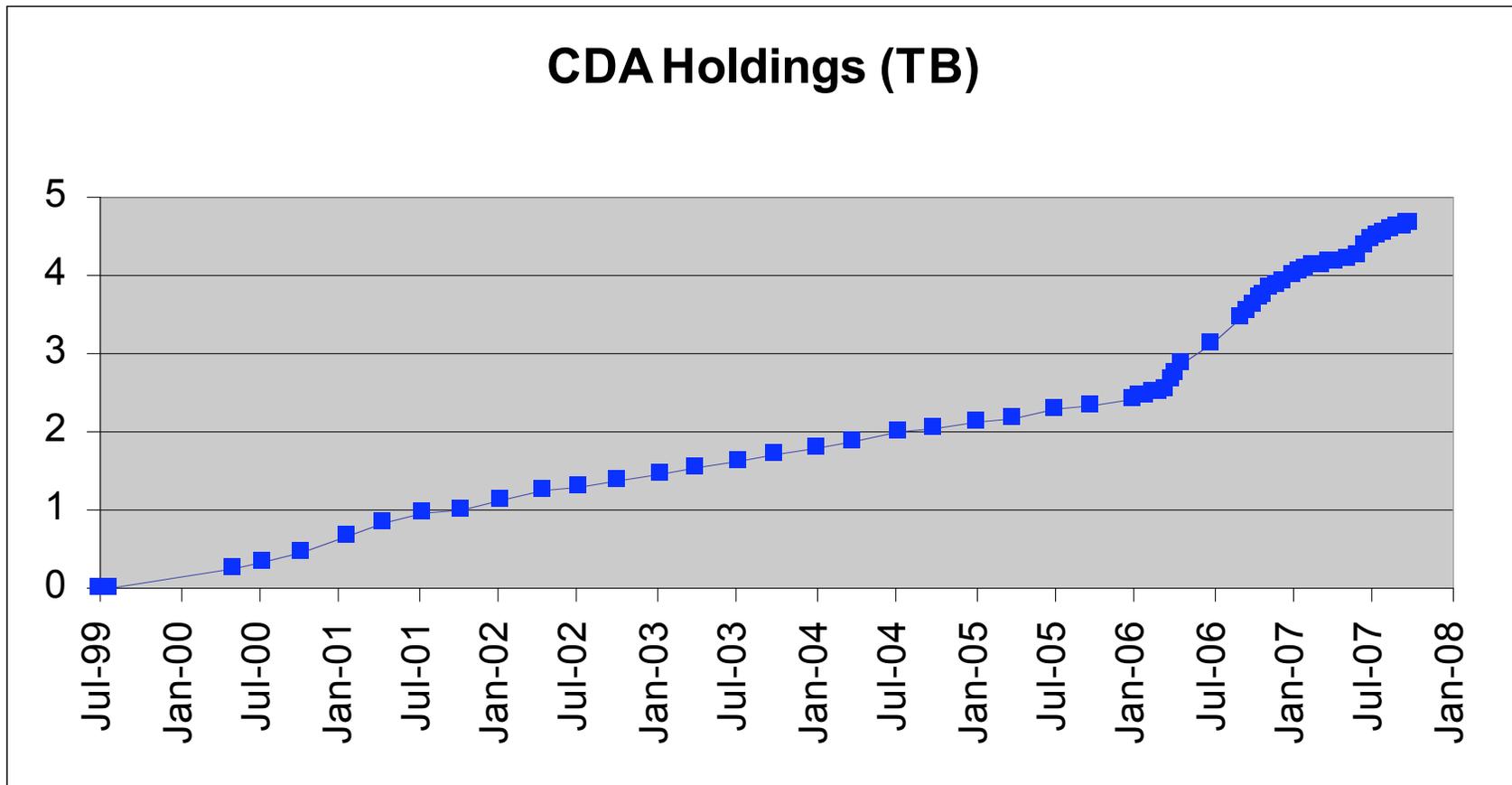
Goals Presented to Senior Review

1. Full *Chandra* Data Archive (CDA) integration with the HEASARC to provide complete access to *Chandra* archive metadata through the multi-mission search and retrieval software. Allows for *Chandra* Archive at SAO/HEASARC long term.
2. Upgrade to CalDB and CalDB tools to allow more effective support for current and future missions.
3. SAOImage ds9 maintenance, ports and as resources allow, selected new functionality.

4. Chandra Data Archive (CDA)

- Current volume:
 - 4.67 TB in 17 million files (after the recent reprocessing run)
 - Essential data at second server at CfA
- Active mirror sites (public primary and secondary data products only)
 - LEDAS, UK (2000)
 - ASDC, Rome, Italy (2004)
 - GSFC, HEASARC (2005)
 - IUCAA, Pune, India (2005)

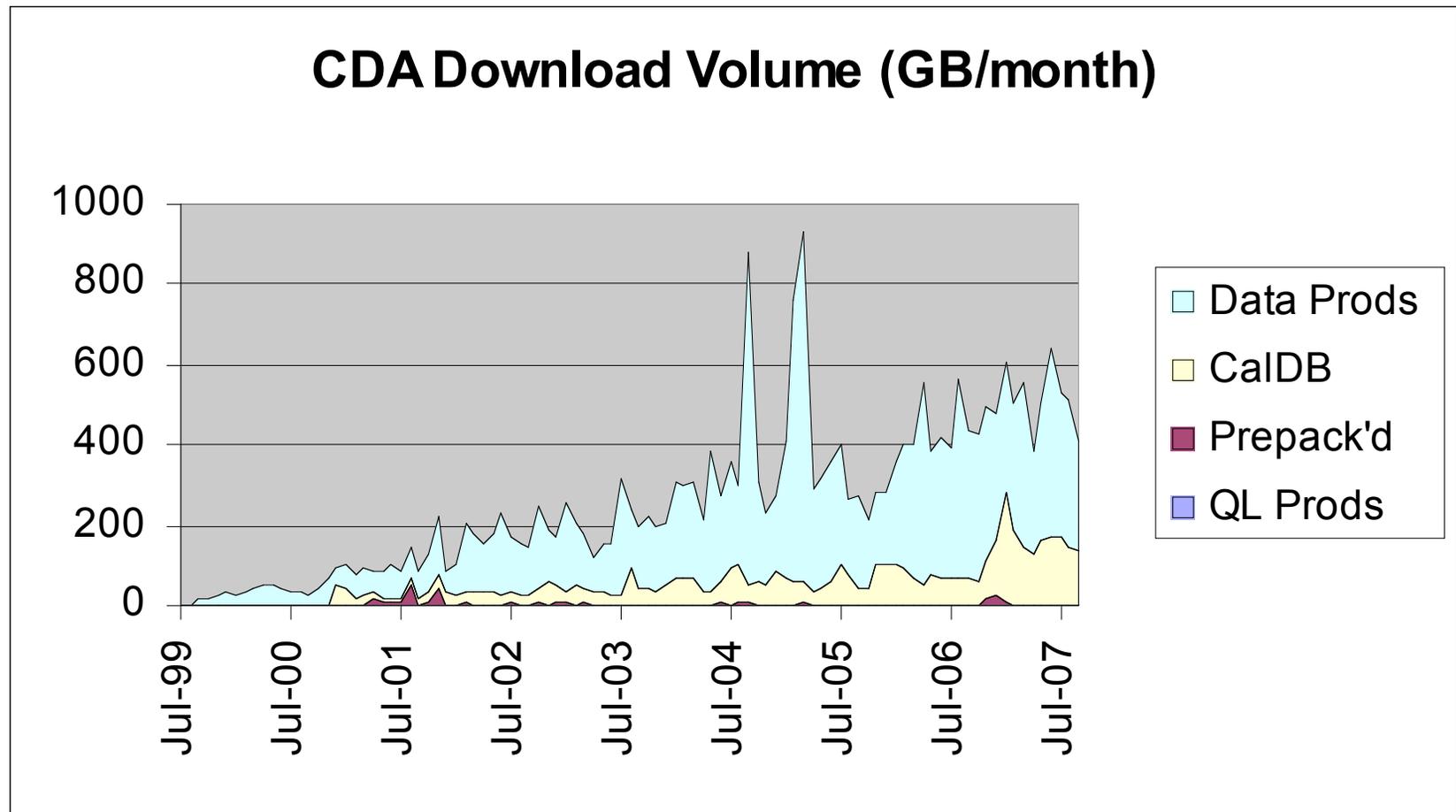
CDA: Holdings



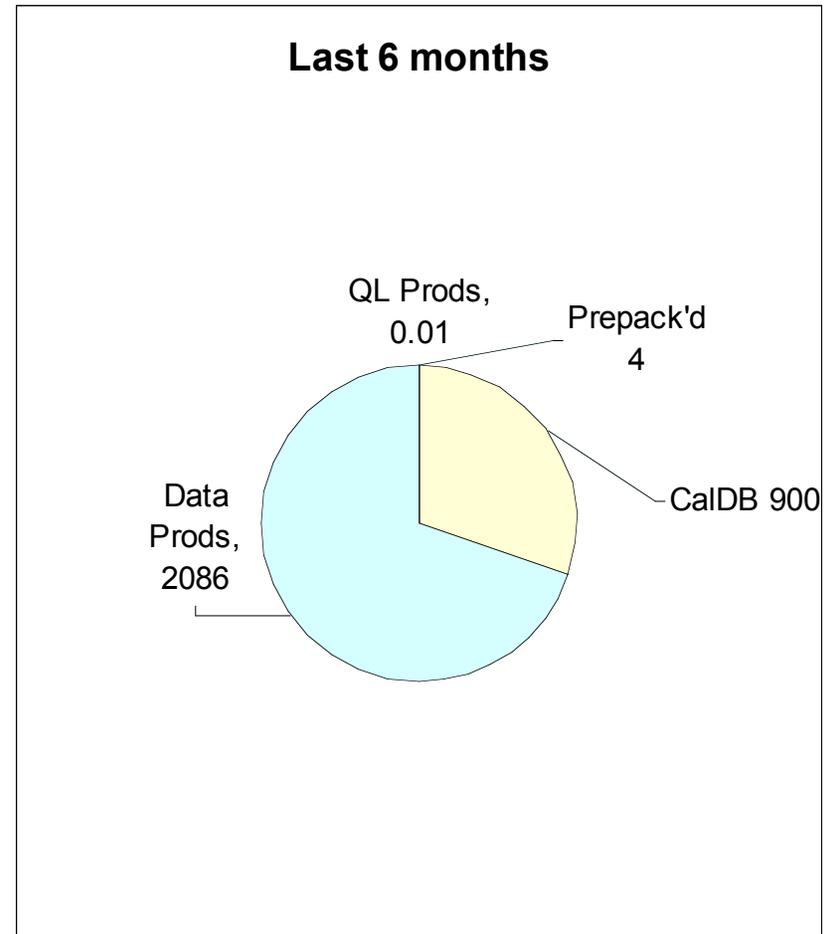
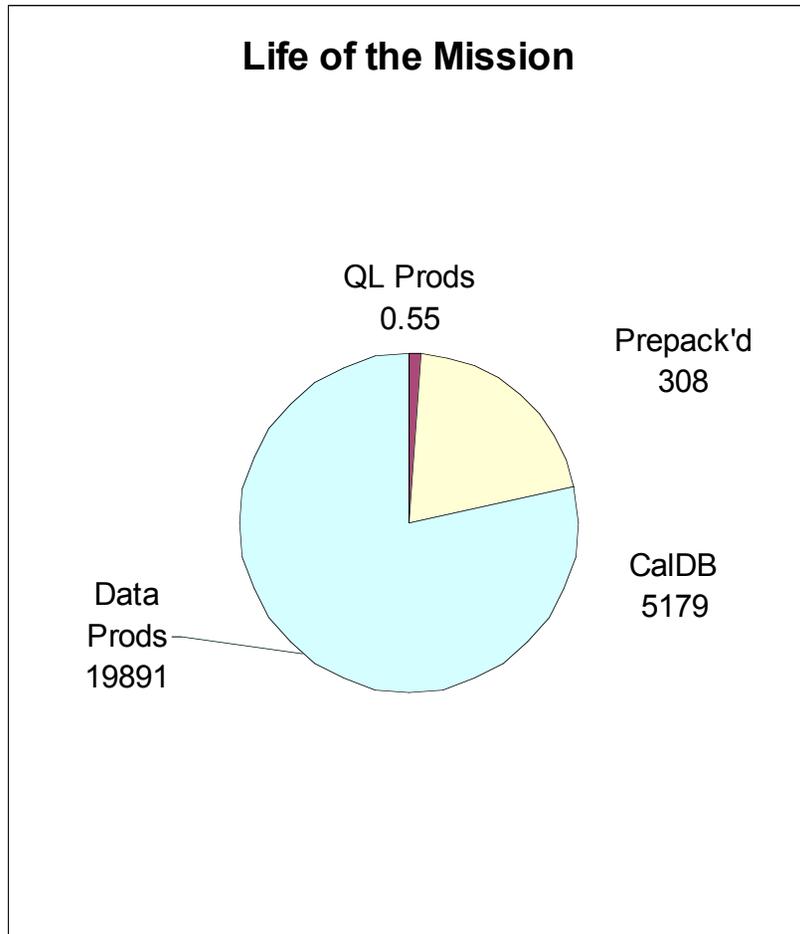
CDA: Observations

- Distributed over the course of the mission:
 - 5909 proprietary observations
- Publicly available:
 - 5264 Scientific observations
 - 1578 Calibration observations

CDA: Downloads



CDA: Downloads



CDA: Bibliography

- Complete through 2006
 - 9,110 articles, of which 5,448 refereed
 - 10,610 data–literature references:
 - 2,431 papers
 - 4,833 distinct observations
 - Categories:
 - 3,926 Present specific observations
 - 4,142 Refer to published results (including multi-wavelength, follow-up analysis, theory to explain Chandra data)
 - 254 Instrumentation, software, operations
 - 425 Predict Chandra results
 - 363 Cannot be classified
- User access:
 - Chaser, Browse
 - Dedicated CDA interface
 - ADS

CDA: Bibliography Package

- Available as multi-mission tool
- Major overhaul
 - Greatly expanded automatic text processing and information extraction from abstract and body:
 - Keywords, software packages used, grant numbers, etc.
- Contains:
 - Configurable database
 - Mission-specific flags and lists, database links
 - Associated literature keywords
 - Literature – dataset links
 - Maintenance interface
 - Automatic ADS mission-specific keyword search of abstract *and* body
 - GUI for processing candidate papers, including categorization, flag assignment, access to paper
- Provided to XMM GOF

5. Calibration Data Base

- Current Mission Support
 - RXTE
 - Chandra
 - Swift
 - Suzaku
 - archival missions: ASCA, BeppoSAX, ROSAT
- Updates since last HUG meeting (Apr 12, 2006)
 - 15 Swift CALDB updates
 - 18 Suzaku updates
 - 9 Chandra updates
- Total Volume ~35 GB (~6 GB from Chandra)

Other Developments

- GLAST caldb under development
 - Scheduled for delivery L-2 months
- Remote usage of caldb popular
- CALDB RSS feed for notification of updates
- Cross-calibration page
- Notification of latest versions via Astro-update:
<http://heasarc.gsfc.nasa.gov/docs/heasarc/astro-update/>

Chandra CalDB: Metrics

- Nine CalDB upgrades
- ~200 new index entries added
 - Two new codename standards introduced
 - ACIS: DEAD_AREA – Cosmic ray dead area corr.
 - GRATING: DISP_REG – ACIS-S/grating extract region
 - ACIS ‘Blank Sky’ background files finalized
 - 66 total files
 - Headers modified for CIAO compatibility
 - Latest CTI-corrections applied
 - 116 old files retired
- 735 “good” CalDB Index File entries.

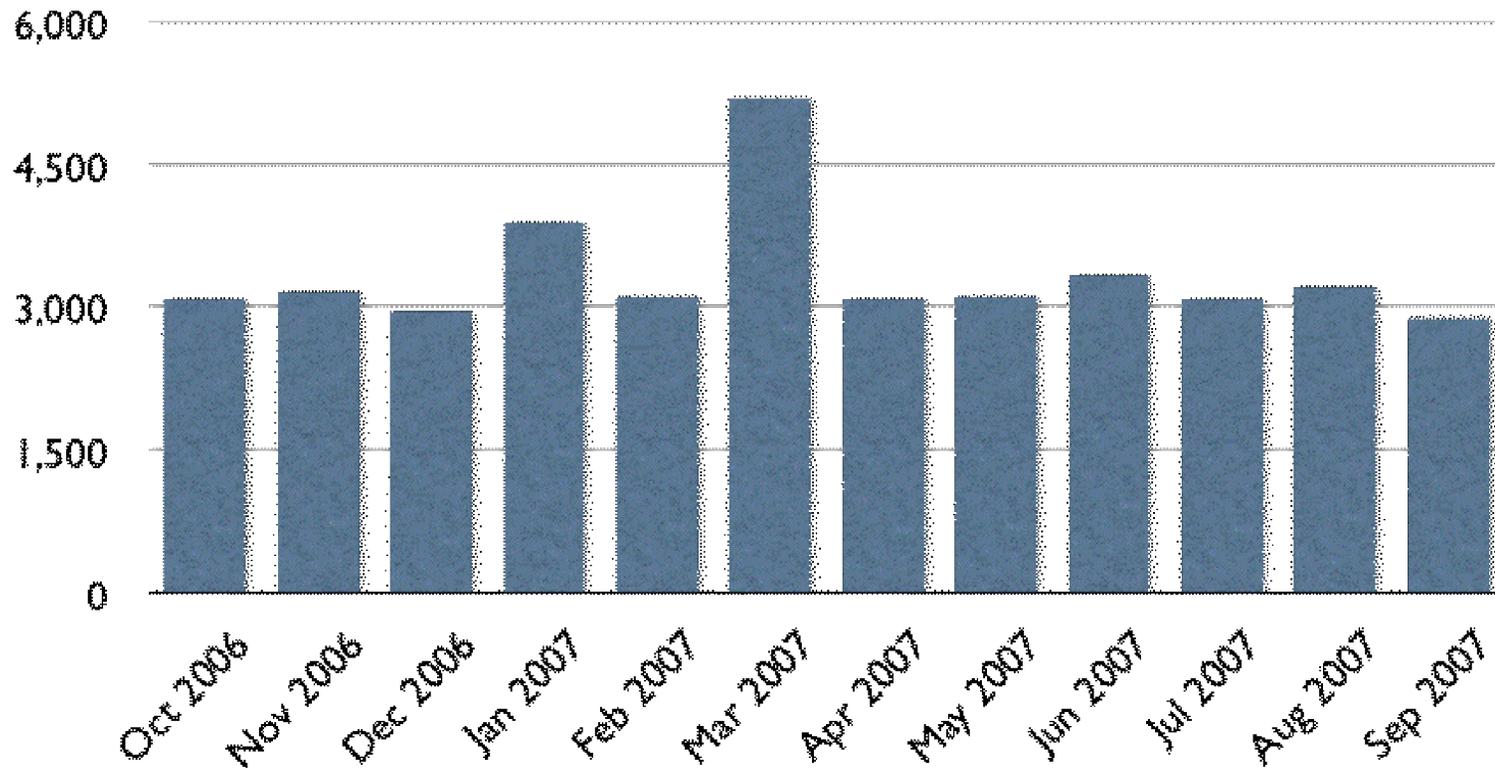
CaIDB HEASARC Tasks

- CaIDB interface upgrade
 - Improves ability to add new calibration items (complex missions)
 - Increases flexibility in selection of appropriate calibration files
 - Requirements document draft approved and posted June 2006, modified March 2007.
 - Software development begun June, 2006.
- CaIDB 4.0.0 construction and interface development
 - CaIDB 4.0.0 directory structure completed and populated
 - Software for the new interface is in testing
 - Index v2.0 builder, library, and search routines completed
 - Backward compatibility with other HEASARC CaIDB structures (Second-level queries only): ASCA (archival), ROSAT (archival), SWIFT (active)

6. SAOImage ds9

- Current Release 5.0
- 4 Public Releases in past year
- Over 40,000 downloads in past year
- Responded to over 600 email requests

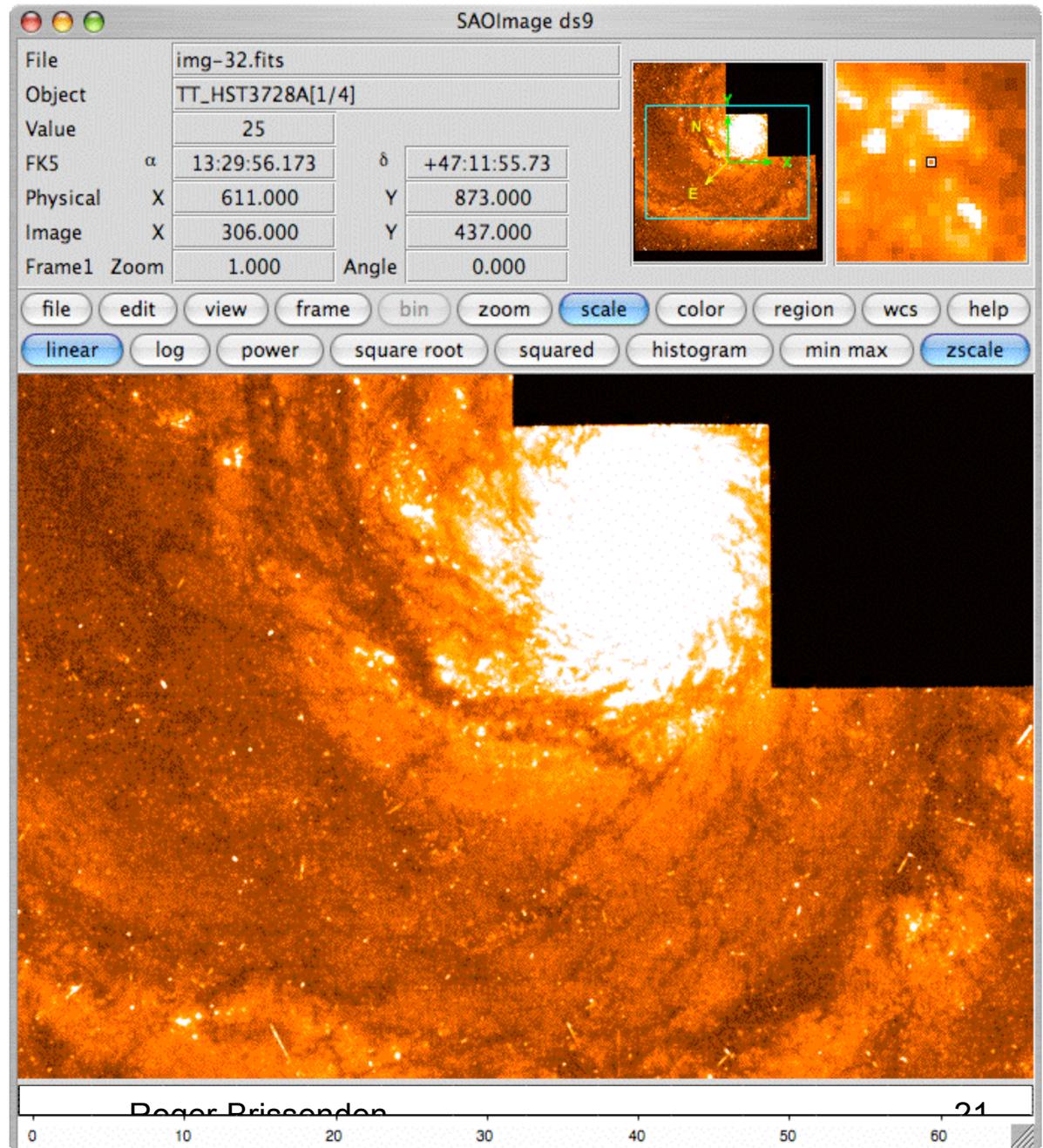
Total Downloads



New Features

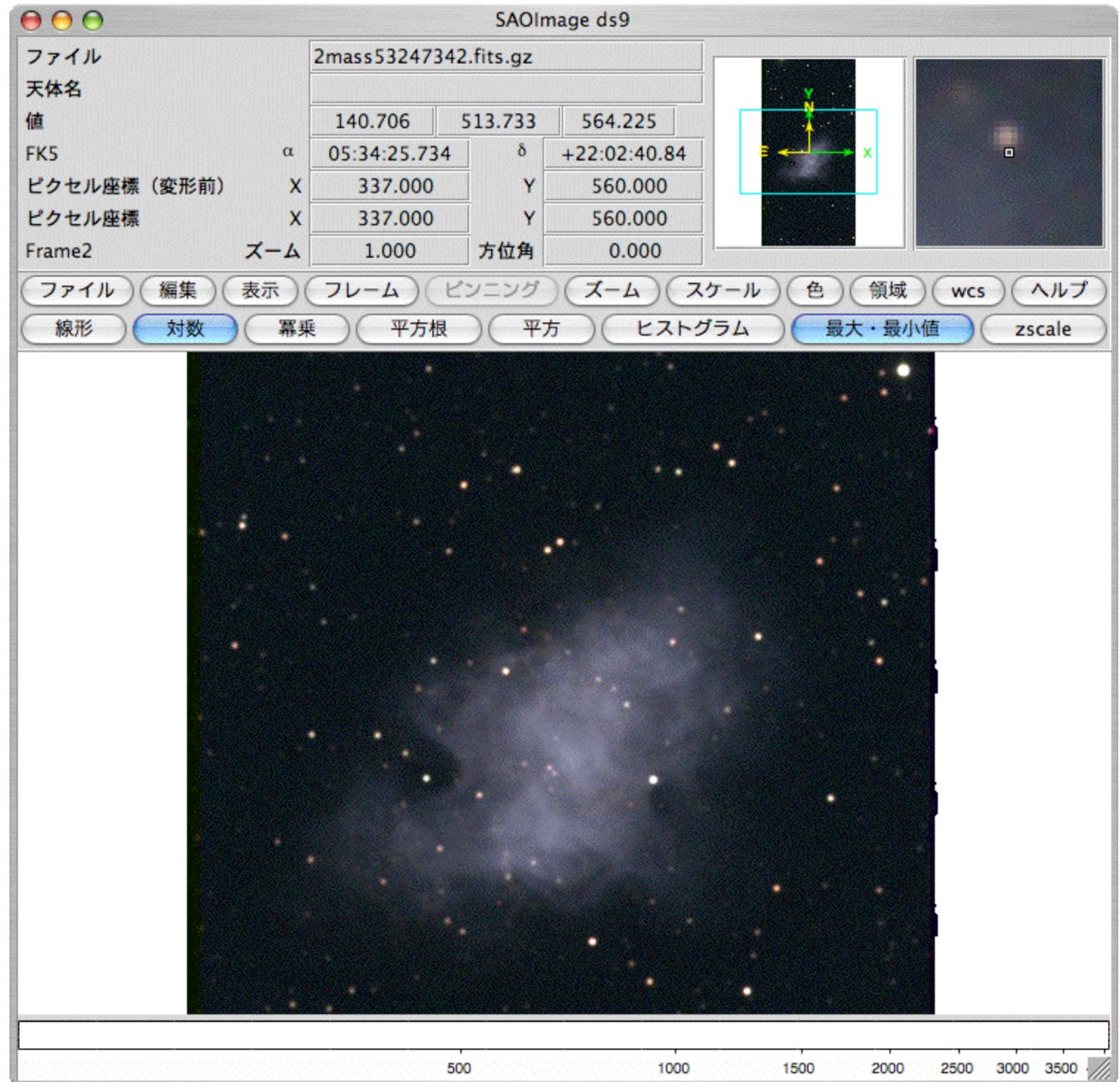
- MacOSX Aqua Implementation
- Multi-Language Support
- HEASARC SkyView interface
- Compressed FITS Support
- Support for Image Masks

MacOSX
Aqua version
is now
available



October 15-16, 2007
HEASARC Users Group

DS9 is now available in Spanish, German, Danish, Portuguese, and Japanese



October 15-16, 2007
HEASARC Users Group

Current Development

- Enhancements to Catalog support
- Improved support for tiff, jpeg, png images
- New presentation features
- 3D volume rendering

Future Development

- Remote Observing Support
- WCS Editor
- Smart Help feature
- Enhanced Windows support